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## PATENT SPECIFICATION



Application Date: May 26, 1930. No. 16,107 / 30.

353,594

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### PROVISIONAL SPECIFICATION.

#### Dustless Filling Machine for Powder or Dry Goods.

I, JOHN WRIGHT LEADLEY, 13, Punstock Road, Darwen, Lancs., British Nationality, do hereby declare the nature of this invention to be as follows:—

5 The invention consists essentially of a machine to fill powder and similar granular material into tins or cartons. The material is fed into a hopper inside which is a vertical shaft carrying a worm, and 10 at the lower end a horizontal conveyor belt pulley. The horizontal conveyor belt is fitted with a number of vanes, forming compartments, spaced equally on the belt and runs round the above mentioned, and 15 a second conveyor pulley within an enclosed framework formed in the manner of a rectangular channel, along which the vanes travel.

On each side of the machine along the 20 straight portion of the channel are located a number of nozzles to convey the material to the receptacles to be filled, these nozzles being fitted in the base of the channel. Slide valve plates operated 25 by handles have corresponding holes opposite the nozzles and serve to shut off the supply of powder to the containers when full. The containers to be filled are arranged beneath the nozzles on 30 special trolleys, made with suitable recesses to receive same, and are also provided with holes cut through. This provision is for the special purpose of expediting the process of sealing opera-

tion after filling, the design being such that the sealing can be carried out whilst the containers are still on the trolleys, thereby enabling continuous operation.

The machine is provided with two tables, for supporting the trolleys which are balanced to rise and fall, and are interlocked with the valve operating handles, so that when the containers are full and the slide valve is closed by the operator, the tables are released and drop clear of the nozzles by weight of the powder filled. The tables are locked in this position until the trolley moves forward to sealing machine, and another comes into position to be filled when the operation is reversed. A foot pedal is provided to enable pressure to be brought against the tables to force the containers close up to soft rubber rings which are placed over the filling nozzles, making the containers airtight against the frame.

The machine may be driven by any motive power, such as an electric motor drive with worm reduction gear, carrying vertical shaft, and one of the conveyor pulleys. The whole is fitted with belt tension device. On each side of machine framework, are fitted windows, giving the operator a clear view of the nozzles, moving vanes and slide valves.

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Dated the 26 day of May, 1930.

JOHN WRIGHT LEADLEY.

### COMPLETE SPECIFICATION.

#### Dustless Filling Machine for Powder or Dry Goods.

I, JOHN WRIGHT LEADLEY, of 13, Punstock Road, Darwen, Lancashire, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to machines for filling powder and similar granular material into tins or cartons and has for its object to provide improved means whereby the filling simultaneously of any

desired number of tins or cartons will be rendered possible and the process thus expedited.

A machine according to the invention is characterised in that the powder or material concerned is fed in regulated quantity from an overhead hopper into an enclosed framework or chamber of substantially flattened oval form in which is disposed a conveyor belt passing about two pulleys rotating and suitably spaced apart in a horizontal plane. The belt

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[Price 1/-]

referred to is provided with projecting vanes, and the chamber in which it works is so formed as to constitute a rectangular channel in which the vanes work. On each side of the machine, that is to say beneath the straight portions of the belt and channel the base of the latter is provided with openings from which depend suitable nozzles. Inside the channel suitable sliding plates are provided by means of which the openings in the base of the channel can be closed. The material to be fed is carried around the channel by the vanes and is permitted to drop through the openings and nozzles into the tins or cartons which are held up by suitable rising and falling tables with their upper ends abutting against rubber or like sealing surfaces surrounding the nozzles. Air displaced from the interior of the tins or cartons by the entry of the powder escapes upwardly into the upper part of the chamber in which the belt works, and a vent pipe from such chamber communicates with the supply hopper.

The accompanying drawing illustrates the relevant portion of a filling machine embodying the invention,

Fig. 1 being an elevation, and

Fig. 2 a plan view;

Fig. 3 is a detail hereinafter referred to.

Referring to the drawings, suitable side frames  $a$ ,  $a$ , support a closed chamber  $b$  which as shown, is of substantially elongated or flattened oval form, with two straight parallel sides. Mounted within this chamber are two discs or drums  $c$ ,  $c^1$  about which is passed a vertical endless belt  $d$  provided with vanes  $d^1$  which traverse continually the annular space  $b^1$  constituted between the depending part of the belt and the peripheral wall of the chamber. The shaft of the drum  $c$  is shown as being driven through a reducing gear  $e$  from a motor  $f$ , and the shaft of the drum  $c^1$  as being carried by a slide  $g$  movable by a screw  $g^1$  to enable the tension of the belt  $d$  to be tightened or slackened at will. Powder is introduced to the annulus  $b^1$ , through two openings  $a^1$  and  $a^2$  from overhead hoppers, not shown, of any suitable construction designed to deliver powder at a regulated rate. The belt  $d$  travels in the direction of the arrow  $B$ , and the feed openings  $a^1$ ,  $a^2$ , are thus disposed at the commencement of the straight run of the belt along each side of the machine. This avoids unnecessary dragging of the powder around the ends of the annulus.

The base of the chamber  $a$  is provided along each flat side with an aligned series of openings  $a^3$  from each of which

depends a nozzle  $h$  of appropriate diameter and length, according to the size of container concerned, the action of which will be fully described later. The vanes  $d^1$  on the belt are, as shown in Fig. 1, preferably arranged at an angle so that as they travel along above the openings  $a^3$  they tend to force down through the said openings the powder which they are carrying around.

Disposed in the bottom of the chamber  $b$ , so as to command the two rows of openings  $a^3$ , are two transversely movable plates  $t$ ,  $t$ , shown as being operated, to cause them to cover or uncover the said openings, by providing them with slots  $t^1$  to receive pins  $t^2$  on discs  $t^3$  carried by spindles  $t^4$ . Partial rotation of these spindles will cause the plates to move from positions in which they are clear of the openings, into positions in which they extend over the openings and prevent descent of powder, through the nozzles.

The cartons or the like  $c$  to be filled are accommodated on tables  $k$ , adapted to be positioned beneath the nozzles  $h$  and to have vertical motion given to them by suitable means to cause the upper edges of the cartons to be passed upwardly against yielding sealing material  $z$  such as rubber on the underside of the chamber  $b$  and surrounding the nozzles  $h$ . If, when the cartons have been so positioned, the valve plates  $t$  are operated to open the nozzles, powder in the chamber  $b$  will as it is carried around by the vanes  $d^1$  of the belt  $d$ , drop down through the openings and nozzles into the cartons. The vanes are preferably inclined as shown, so that as they travel along they exert a downward pressure on the powder and tend to force it down through the nozzles.

The nozzles extend down a suitable distance into the cartons as indicated in Fig. 3, which shows a section of a carton in filling position, and the upper end of a nozzle is preferably provided with an air vent hole or holes  $h^1$ . Air disposed from the carton by the incoming powder escapes upwardly into the powder chamber, the vent hole or holes facilitating the egress of the air without it having to pass through the stream of descending powder.

Although I have shown only one row of openings and nozzles along each side of the chamber  $b$  it will be apparent that two rows may be provided, if desired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

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1. Apparatus for filling powdered materials into cartons or containers characterised by the provision of a chamber adapted to receive material at a regulated rate, such chamber being of substantially flattened oval form and containing a travelling belt extended between two drums rotating in a horizontal plane, such belt being provided with vanes adapted to carry around the material fed to the chamber and permit it to drop through openings in the base of the chamber along its two straight sides, such openings having nozzles depending beneath them and sliding plates being provided to enable the openings to be closed, substantially as set forth. 15
2. Apparatus for filling powdered material into cartons or containers constructed and arranged substantially as herein described with reference to, and as illustrated by, the accompanying drawings. 20

Dated the 24th day of February, 1931.  
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Agents for the Applicant.

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[This Drawing is a reproduction of the Original on a reduced scale]

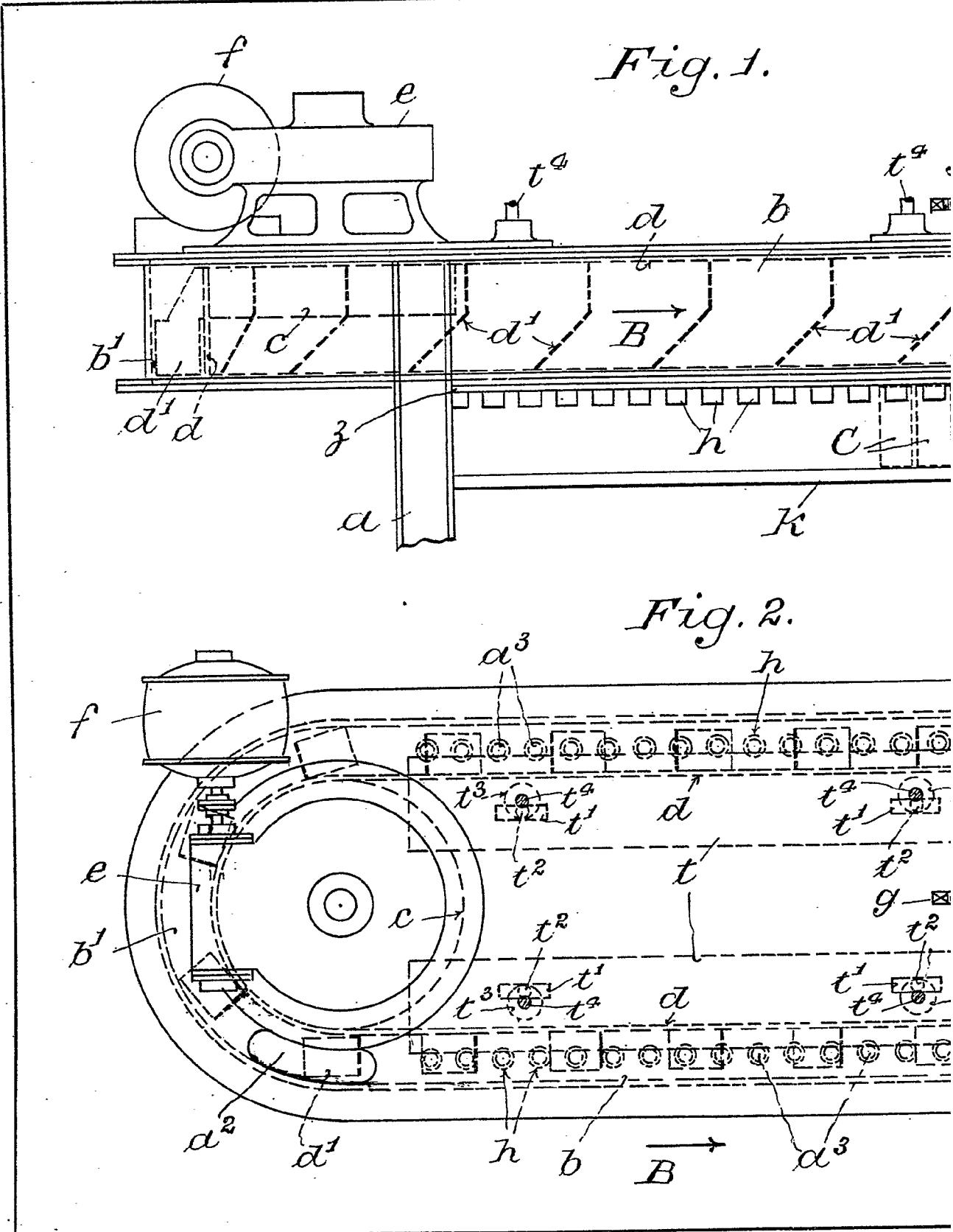


Fig. 1.

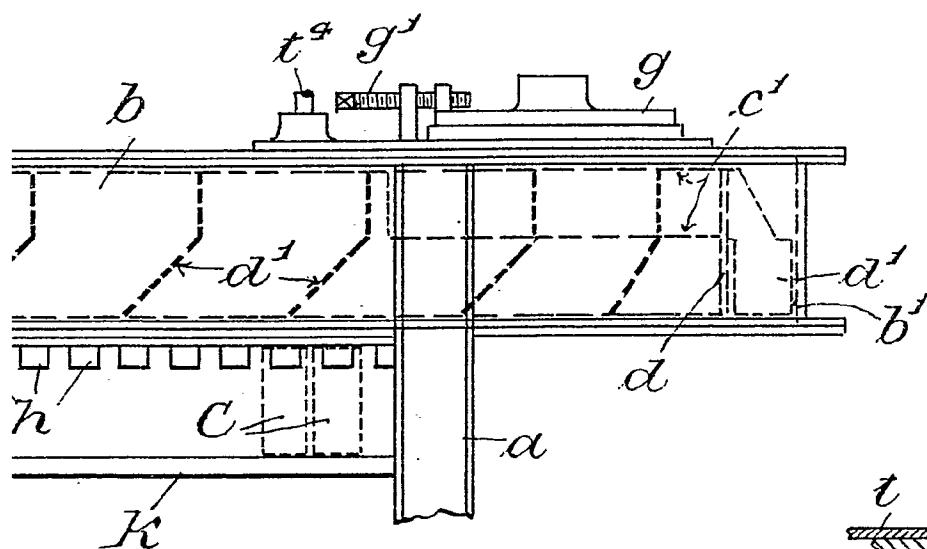


Fig. 3.

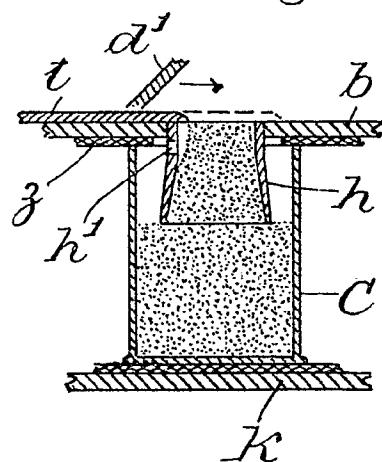


Fig. 2.

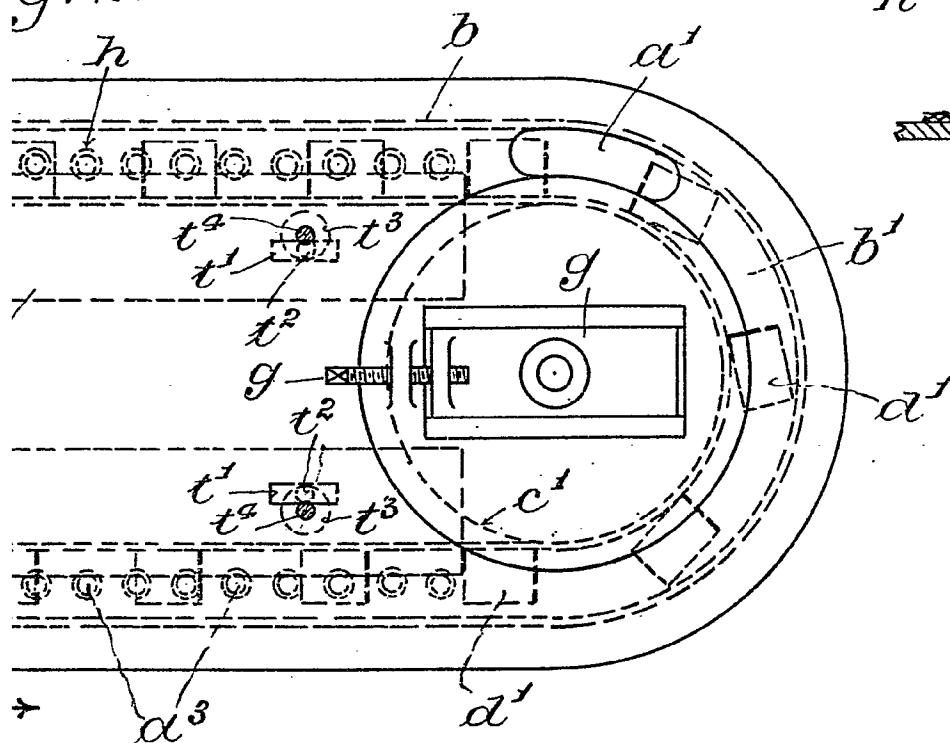


Fig. 1.

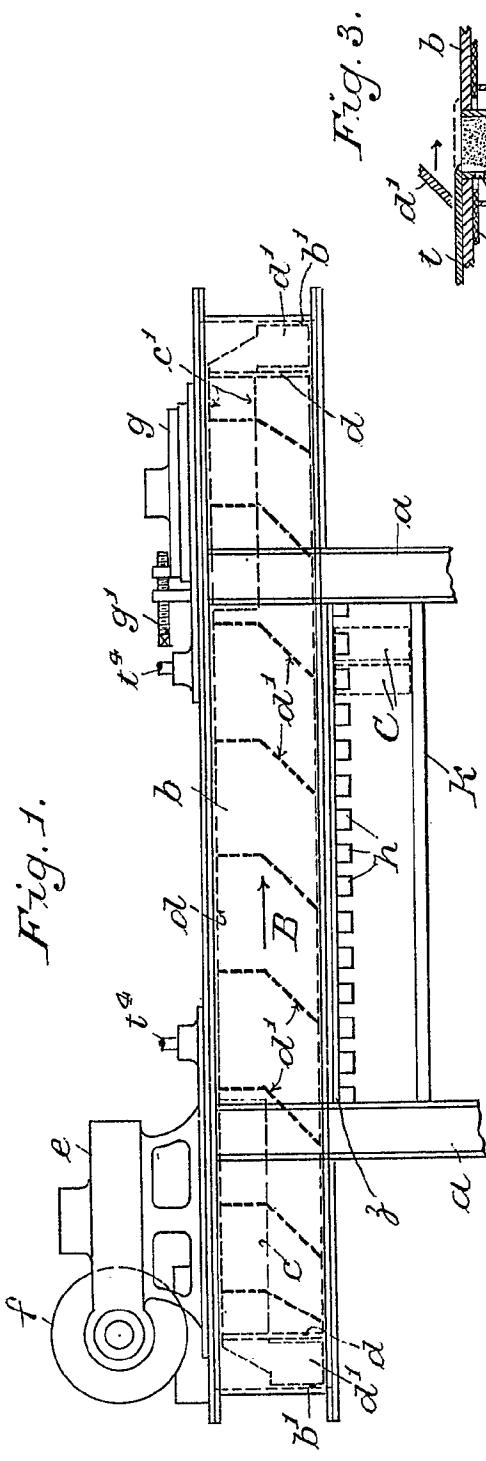


Fig. 3.

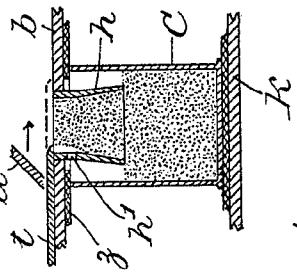


Fig. 2.

